REMARKS

Claims 1 to 10 are currently pending. No claims have been cancelled, added or amended in this paper. Applicants thank the Examiner for the indication of allowability of the subject matter of claims 5 and 6.

Claim Rejections Under 35 U.S.C. § 102(b)

The Examiner introduces the rejection of claims 1-4 and claims 7-10 under 35 U.S.C. § 102(b) as anticipated by German Patent No. DE 2,048,144 (Steiner). As the Steiner reference is published in German, Applicants submitted a copy of an English language abstract of the document in an Information Disclosure Statement dated June 29, 2004. Applicants presume that the Examiner's rejection is based on the English language abstract and the drawings of the Steiner reference. Applicants have since obtained an full English translation of the document (the "English Translation"), and a copy of the translation is enclosed with this Response.

The Examiner sets for the basis for anticipation of the subject matter of independent claim 1 and dependent claim 8 as follows:

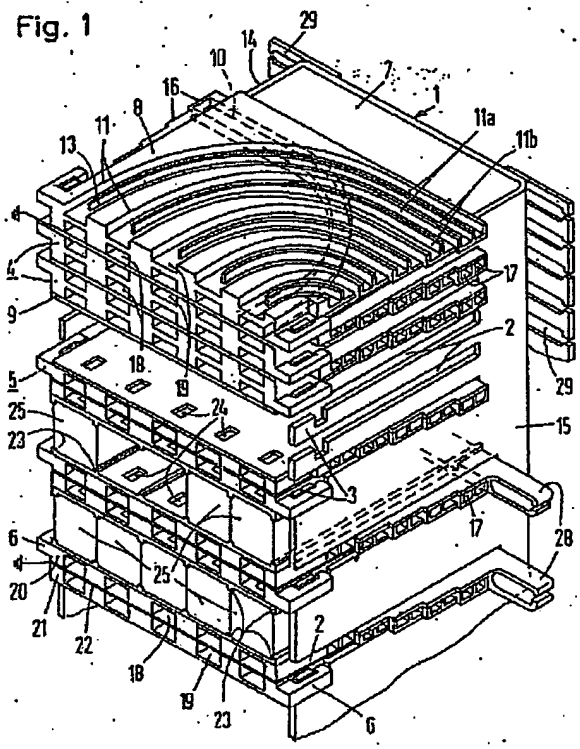
> "German patent DE 2048144 discloses a telecommunications terminal block, comprising a splitter module, said block including:
>
> at least one contact module (4 or 5) including a front side and a rear side, an upper side and a lower side, a first side and a second side opposite the first side, as well as at least (Fig. 3) one row of contacts (33) extending between the first side and the second side which are exposed at the front side, and
>
> at least two arrays each comprising at least two wire guides (10, 11), arranged at the upper side and lower side of the contact module, which lead cable contactors terminated at the contact (33) from the front side to the first side or the second side, the wire guides of each array leading to a single side,
>
> whereby at least two of the arrays adjoin each other and at least one row of contacts and are assigned to said row of contacts,
>
> whereby the wire guides of the each such array lead to opposite sides." (Office Action at page 2).

The Examiner also finds disclosure in the Steiner reference that allegedly anticipates the subject matter of dependent claims 2-4, 7 and 9-10.

Applicants respectfully offer the following traversal. The Steiner reference neither teaches nor suggests a telecommunications module configured to have multiple arrays of adjoining wire guides as recited in the rejected claims. Specifically, the reference fails to disclose a complement of wire guide arrays oriented about a contact module such that at least two arrays adjoin both each other and at least one row of contacts and where both arrays are assigned to the row of contacts they adjoin and the guides of each array lead to opposite sides of the module. Put somewhat more simply, the Steiner reference fails to disclose the at least 2:1 ratio of adjoining arrays to contact rows recited in the rejected claims. Providing at least two adjoining arrays for a row of contacts in a contact module gives efficient access for wiring from that row of contacts to both opposite sides of the module. The devices of the Steiner reference lack this feature and this advantage.

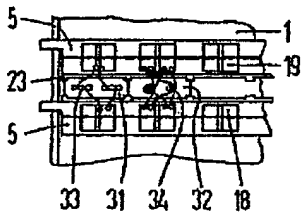
The Steiner reference shows a stacked configuration of wire guides in Figure 1 (reproduced below):

Fig. 1



This depicted configuration shows only the insertion of a generic "component" (25) between layers of wire guides. (*See* English Translation at page 6). The Examiner points to Figure 3 of Steiner (reproduced below) as disclosing a configuration of a particular component (31) having a double clamping connection site (33):

Fig. 3



The description accompanying Figure 3 associates wire guides (18) and (19) with components (33) and (32), consistent with clear depiction of the wires in the drawing. (See English Translation at page 7). As is clearly evident, the wire guides associated with the row of contacts in Figure 3 are not configured in adjoining arrays, and for at least this reason cannot be held to anticipate the rejected claims. Applicants respectfully assert that the rejected claims are therefore patentable over the Steiner reference and request reconsideration and withdrawal of the rejection.

Conclusion:

In view of the above remarks Applicants submit that the application is in condition for allowance and respectfully request its reconsideration.

Respectfully submitted,

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(54) DISTRIBUTOR PANEL FOR ELECTRICAL DEVICES

(61) Addition to: —

(62) Continuation of: —

(71) Applicant: Siemens AG, 1000 Berlin and 8000 Munich

Representative in accordance with § 16 Pat. Law: —

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Distributor panel for electrical devices

This invention relates to a distributor panel for electrical devices, in particular telephone facilities, with wire guide channels passing through an insulator for the purpose of connecting incoming and outgoing electrical conductors to connectors located on the front side of a panel.

In such known distributor panels, connector and/or contact elements, which represent integrated components of the distributor panel, are mounted in an insulator and/or in several flat insulators stacked on top of each other. These connector and contact elements can e.g. be configured as single or double clamp connectors for the direct electrical connection of lines arriving at the distributor panel with lines leaving the distributor panel, or as separable contact components in the form of contacting springs that are in detachable and/or separable paired contact with one another. At the junction site of these connector and/or contact elements, the lines are usually introduced in a more or less bundled form and are brought into wire guide channels where they are fanned out in a time consuming operation and are connected to a respective associated connector.

As a result of the design described above, difficulties arise both in the case of the design and the assembly of a distributor facility, in particular in the case a telephone service. Since the number of subscribers in telephone technology as well as in all areas of message transmission technology increases constantly, the design of a distributor facility must anticipate that the supply of distributor positions (connection points) should suffice for years to come. It must thus be anticipated that, e.g. in the construction of a telephone switching office, a sufficient number of distributor sites will be created to be able to connect newly added telephone subscribers for a prolonged period of for example 30 years. One will, for example, in the construction of such an office, have to provide for an anticipated capacity for incoming lines in relation to the currently existing or required participant lines at a ratio of 5 to 1, which ratio is then gradually reduced to a ratio of approximately 1.5 to 1.
In the case of the use of the aforesaid known distributor panels, there is the difficulty that such a construction, which is initially oversized in relation to current requirements, is associated with a

substantial expenditure of expensive connector and contact elements of the aforesaid kind. This means that, in addition to the already costly, but in most cases inevitable, overcapacity of eventually required electric lines, there is an initial at least partly unused oversupply of complex and expensive connector and contacting elements.

It is therefore the object of this invention to eliminate these inadequacies of existing facilities by providing a distributor panel that is capable of reducing the economic cost in the construction of a distribution facility and to provide for an adaptation of the distribution facility, which can be easily accomplished at any time, to the respective existing requirements.

This task is accomplished according to this invention in that the entrances of a majority of wire guide channels passing through the interior of the panel are distributed in groups running in several mutually parallel planes toward the front side of the panel, the exits of these channels being immediately adjacent to each other for ready-to-connect associated incoming and outgoing lines and attachable elements connecting to the front side of these panels. With such a distributor panel a component is created which, initially completely independent of connection elements or electrical connection sites, represents a wire guide component, within which all lines offering advance capacity from the moment of construction to the connections presumably needed in the future are configured and are brought into a position that is ready for connection, such that an adaptation of the distributor to the respective existing connection requirements can take place in a step by step manner by simply introducing the connecting elements into the pre-projected connection sites. In a such a distributor panel, each individual subscriber line in particular, or the wire strands of one such subscriber line, is associated with its own wire guide channel, with the exits of the wire guide channels for ready-to-connect associated incoming and outgoing lines, also called office cables and switched lines in telephone technology, being mutually adjacent, such that the fact that these lines protruding from the exits belong together is not only immediately visually evident but is compellingly obvious to the eye.

For example, in the case of a telephone switching office equipped with distributor panels of this invention, the incoming lines, which are e.g. at a ratio of 5 to 1 with respect to the currently required subscriber lines, are ready for connection. However, it is only necessary to join as many incoming lines via connecting elements, e.g. connecting clamps, double clamping or solder connections, separable contacts or the like, with outgoing switching lines, as there are subscribers. As a result, the ratio of connecting elements to outgoing lines or switching lines at each stage of development of the office can be 1 to 1 at all times. The already very high construction costs due to advance wiring capacity are thus advantageously not increased by corresponding advance provisions for connecting components or connection sites.

A further advantageous embodiment of the distributor panel of this invention is provided by the fact that the wire guide channels for the incoming lines pass via first mutually parallel levels from a first side of the panel to the front side of the panel along an arc, and that the wire guide channels for the outgoing lines located in second mutually parallel levels in between pass from a second side opposite the first side to the front side along an arc, and that the wire guide channels for the arriving lines run crosswise to the front side of the panel.

In accordance with a further embodiment of this invention, the wire guide channels are again subdivided into individual wire guide paths by interposed bars. Thus, if for example each subscriber line (incoming as well as outgoing) is associated a wire guide channel, it becomes possible, through this division of the wire guide channels into two parts, to reserve one wire guide path for each wire guide channel for a possible change in the switching sequence. In the case of a forthcoming change in switching sequence, the new line is placed into the reserved wire guide path and is brought into a position that is ready for making the connection, without the still connected old line first having to be removed, and without the possibility that the newly placed lines could be confused with the old lines. By means of this clearly evident spatial separation of the wire guide channels or wire guide paths, a connection sequence that is extraordinarily cleanly separated into functional units is obtained, which not only simplifies the effort required to make the electrical connections but also simplifies the insertion of new lines as well as the removal of old lines.

In accordance with a further embodiment of this invention, gaps for mounting components featuring connection sites and containing connecting elements are provided between successive levels or pairs of levels of the wire guide channels. Individual clamp connectors or blocks provided with several clamp connectors can e.g. be simply plugged into these gaps, so that the connection sites of these components are in the immediate vicinity of the connecting ends of the lines that are to be interconnected with each other. In case the distributor is used as a so-called pass-through distributor, such a component can e.g. be equipped with double connecting clamps or double soldered connections or with separable contact springs.

Further advantageous details of this invention are represented in the drawings and the example embodiments described below.

The drawings show:

Fig. 1 a perspective view of a distributor panel of this invention,

Fig. 2 a top view on the distributor panel according to Fig. 1,

Figs. 3, 4 and 5 partial views of the distributor panel of the preceding figures, in which the distributor panel is equipped with various components.

In the example embodiment in accordance with Figures 1 and 2, 1 designates a U shaped support frame, which is provided with unilaterally open guide slots 2 on both free side pieces, having detents 3 located in the area of the open sides. Modular layers 4 or 5 consisting of insulating material can be inserted into this guide 2, which modules are provided with numerous wire guide channels which will be described in detail below. The modular layers 4, 5, which can consist of one piece or of several parts that are connected to each another, are, in the region of the front edge in Fig. 1, equipped with sprung counter-detent elements in the form of detent hooks 6, which come to rest in the detents 3 when the modular layers 4, 5 are inserted into the guide slots 2.

The support frame 1 together with the modular layers 4, 5 constitutes a distributor panel, i.e. a component of a distributor facility. At the rear of the panel, in the example embodiment the back side 7 of the support frame 1, the distributor panel can be attached to a vertical or horizontal cross-beam, which is not shown, of a rack, which is also not shown.

In the example embodiment, the modular layers designated by 4 consist of a flat insulating part 8 and an electrically conductive shield sheet 9, which, as suggested by an example in Fig. 1, is e.g. grounded by means a grounding strip shared by all shield sheets. The insulating part 8 and shield sheet 9 can e.g. be combined by gluing. The insulating part contains wire guide channels 10 and 11 (see also Fig. 2) in two planes that are parallel to each other, which channels are subdivided into the respective wire guide paths 10a and 10b or respectively 11a and 11b by the interposed bars 12 or 13. The figures show clearly that the wire guide channels 10 and 11 in the successive levels proceed from opposite sides 14 and 15 of the distributor panel to the front of the panel along an arc, so that the entrances 16 and 17 of these wire guide channels, which are separated from each other in a stepwise manner, terminate in groups on the sides 14 and 15, while the exits 18 and 19 of these wire guide channels terminate at the front of the panel.

In the example embodiment, the modular layers 5 consist of two flat insulating parts 20 and 21 with an interposed layer 22, which can again be configured as a shield sheet. The insulating

parts 20 and 21 are of the same design and are stacked and e.g. glued on top of each other in mirror image fashion.

Most of the modular layers 5 are furthermore provided with attached or molded-in rib-like guide elements 23 and detent openings 24 on opposite open sides. These guide and detent elements serve the purpose of guiding and detaining [locking] components 25, which, as will be described in greater detail below, are equipped with connecting and joining elements and which can be inserted into the gaps between neighboring modular layers 4, 5. The components 25 are provided with detent hooks, which attach to the detent openings 24.

The distributor panel in accordance with Figures 1 and 2 altogether constitutes a wire guide element for the orderly installation of incoming lines 26 and outgoing lines 27 or switched lines at the distributor panel. Due to the presence of wire guide channels groups per level, it is possible to assign its own wire guide channel 10 and respectively 11 to each individual subscriber line of e.g. a telephone network. In the initial construction of the distribution facility, one of the subscriber lines 26, 27 or respectively their a- and b-strands are e.g. placed into the wire guide channels 10a and 11a, with the introduction being facilitated by the inlets 16 and 17 which are offset in a stepwise manner. This initial construction can also include advance provisions for lines which are only needed for future further expansion of the facility. These lines 26, 27 provided as advance provisions can, as Fig. 2 shows, be mounted in a protected manner by inserting their free ends into the wire guide channels 10b, 11b and can be prepared for use at any time.

As the figures also show, the incoming and outgoing lines 26 and 27 associated with a circuit of particular subscriber lines are immediately adjacent to each other in the installed state, in which they protrude from the exits 18, 19 with their free ends. Thus, in the example embodiment, e.g. the incoming line 26 of a first subscriber lies directly above the outgoing line 27 of the same subscriber. In the lower area of the distributor panel in accordance with Fig. 1, gaps for inserting the components 25 are located between these neighboring exits 18,19.

If the switching order of the specified subscriber is to be modified, the reserved wire guide channels 10b and 11b are available for placing new lines or modified lines, with these lines also being brought into ready-to-connect positions, so that a change in connection can take place very rapidly at the front of the panel and without first disturbing the existing switching sequence.

The lines 26 and 27 respectively belonging to a level of the board can be held simultaneously in a freely accessible wire guide element in the back area of the panel, which wire guide elements

can be configured as parts of the individual modular layers 4, 5 in the form of wire guide hooks 28 or as parts of the support frame 1 also in the form of wire guide hooks 29.

As Fig. 2 shows, it is e.g. possible with use of the modular layers 4, to simply electrically interconnect the associated incoming and outgoing lines with each other as required by means of a simple connecting device 30.

Further possible connections are suggested in the Figures 3 to 5.

In Fig. 3, the components 31 and 32, which, like the components 25 in accordance with Fig. 1, can be inserted between the modular layers 5, have double clamping connection sites 33, at which the associated and neatly disposed lines exiting from their respective wire guide channels 18, 19 can e.g. be joined mechanically and interconnected. The component 32 has wrapping posts 34, to which the lines can be connected by wrapping them.

In the example embodiment in accordance with Fig. 4, a component 35 is inserted into the distributor panel, which component is equipped with separable contact springs, which are freely accessible at the front of the panel as connecting clamp sites 36 and 37, as well as with openings 38 for introducing disconnection and test plugs. There are contacts to ground 39 within the distributor panel for grounding the incoming lines.

As shown in the example embodiment in accordance with Fig. 5, it is also possible to insert components 40 with connectors for overvoltage protection devices or with connectors for other electrical components such as diodes 41 or the like into the region between the modular layers.

It is also possible to use the open area between the back of the modular layers 4, 5 and the back 7 of the support frame 1 for the purpose of holding overvoltage protection devices associated with the incoming lines 26.

The distributor panel described makes it possible to install the entire ready-to-connect wiring with consideration given to the constantly growing number of subscriber in such a manner that, through an ongoing insertion of components containing connecting elements, an adaptation to the current requirements can be achieved.

14 claims

5 figures

1-9367

CLAIMS

1. Distributor panel for electrical facilities, in particular telephone facilities, with wire guide channels passing through an insulating part for the purpose of connecting incoming and outgoing electrical lines to connection sites at the front of a panel, **characterized by the fact** that the entrances (16, 17) of most wire guide channels (10, 11) passing through the interior of the panel are subdivided into groups at the periphery of the panel and pass to the front of the panel in several mutually parallel levels, the exits (18, 19) of the channels for ready-to-connect associated incoming and outgoing lines (26, 27) being directly adjacent to each other and possibly to the connecting elements that can be inserted in the front region of these panels.

2. Distributor panel according to claim 1, **characterized by the fact** that the wire guide channels (10) for the incoming lines (26) pass in first levels that are parallel to each other from a first side (14) of the panel to the front of the panel along an arc, and that the wire guide channels (11) for the outgoing lines (27) pass in intermediate second levels from a second side (15) to the front of the panel opposite the first side, along an arc which crosses the wire guide channels for the incoming lines.

3. Distributor panel according to claim 2, **characterized by the fact** that the wire guide channels (10, 11) are again subdivided into individual wire guide paths (10a, 10b; 11a, 11b) by interposed bars (12, 13).

4. Distributor panel according to claim 2, **characterized by the fact** that electrically conductive shield sheet (9, 22) are located between the successive levels.

5. Distributor panel according the preceding claims, **characterized by the fact** that the individual entrances (16, 17) to the wire guide channels (10, 11) are offset from each other in a stepwise manner on the sides of the panel.

6. Distributor panel according to the preceding claims, **characterized by the fact** that a freely accessible wire guide element is provided for each wire guide channel level in the back area (7) of the panel opposite the front of the panel

7. Distributor panel according to the preceding claims, **characterized by the fact** that gaps between successive levels or pairs of levels of the wire guide channels for mounting com-

ponents (25, 31, 32, 35) having connection sites and containing connecting elements are provided.

8. Distributor panel according to the preceding claims, **characterized by the fact** that it is formed of a number of individual modular layers (4, 5) or of modular layers containing several levels of wire guide channels.

9. Distributor panel according to claims 7 and 8, **characterized by the fact** that the modular layers (4, 5) are provided with guiding and/or switching elements (23, 24) on their open sides.

10. Distributor panel according to claim 9, **characterized by the fact that** several guide and/or switching elements (23, 24) are provided for the individual wire guide channel of a modular layer.

11. Distributor panel according to claims 8 to 10, **characterized by the fact** that, in the back area (7) of the panel, modular layers are provided with preformed wire guide hooks (28).

12. Distributor panel according to claims 8 to 11, **characterized by the fact** that each modular layer component (5) consists of two mirror image-wise superimposed insulating parts (20 and 21), each having a layer of wire guide channels that is open toward the inner side surfaces, between which an intermediate layer (22) is located.

13. Distributor panel according to claims 8 to 12, **characterized by the fact** that a U shaped support frame (1) is provided, which is unilaterally equipped with open guide slits (2) for inserting the modular layers (4, 5) as well as with detent elements (3) for arresting modular layers provided with counter-detent elements (6).

14. Distributor panel according to claim 13, **characterized by the fact** that the support frame (1) is equipped with wire guide hooks (29) in the back region (7) of the panel.

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